Amendments to the Claims:

1. (currently amended) An antibody fragment comprising a ~~Fab or~~ Fab' fragment that has been modified by attachment of at least one effector molecule wherein the heavy chain in the fragment is not covalently bonded to the light chain, and both the interchain cysteine of C_L and the interchain cysteine of C_H1 have been replaced with another amino acid, and wherein said at least one effector molecule is PEG or a PEG derivative, and wherein the hinge region contains one or two cysteines.

2. (original) The antibody fragment of claim 1 wherein the interchain cysteine of C_L and the interchain cysteine of C_H1 have been replaced with a non-thiol containing amino acid.

3. (original) The antibody fragment of claim 2 wherein the interchain cysteine of C_L has been replaced with serine.

4. (original) The antibody fragment of claim 2 wherein the interchain cysteine of C_H1 has been replaced with serine.

5. (original) The antibody fragment of claim 2 wherein both the interchain cysteine of C_H1 and the interchain cysteine of C_L have been replaced with serine.

6. (previously presented) The antibody fragment of claim 1 wherein the interchain cysteine of C_L is at position 214 of the light chain and the interchain cysteine of C_H1 is at position 233 of the heavy chain.

7. (previously presented) The antibody fragment of claim 1 wherein at least one effector molecule is attached to the heavy or light chain constant region of the fragment.

8. (currently amended) The antibody fragment of claim 1 wherein an effector molecule is attached to ~~a~~ an engineered cysteine in the light chain constant region and to ~~a~~ an engineered cysteine in the heavy chain constant region of the fragment.

9. (original) The antibody fragment of claim 8, wherein the cysteine residues in the heavy and light chain constant regions which are attached to effector molecules would otherwise be linked to each other via a disulphide bond if the effector molecules were not attached.

10. (previously presented) The antibody fragment of claim 1 wherein the fragment is a Fab' fragment that contains a modified hinge region.

11. (previously presented) The antibody fragment of claim 10 wherein the modified hinge region contains 1 cysteine residue.

12. (previously presented) The antibody fragment of claim 11 wherein the modified hinge region comprises the sequence of SEQ ID NO:1 or SEQ ID NO:2.

13. (previously presented) The antibody fragment of claim 10 wherein the modified hinge region contains 2 cysteine residues.

14. (previously presented) The antibody fragment of claim 10 wherein the modified hinge region comprises the sequence of SEQ ID NO:3 or SEQ ID NO:4.

15. (previously presented) The antibody fragment of claim 1 wherein the fragment is a Fab' fragment in which at least one effector molecule is attached to the hinge region of the fragment.

16. (previously presented) The antibody fragment of claim 15 in which two effector molecules are attached to the hinge region of the fragment.

17. (previously presented) The antibody fragment of claim 1 wherein the fragment is a Fab' fragment in which each effector molecule attached to the fragment is attached to the hinge region of the fragment.

18. (previously presented) The antibody fragment of claim 1 in which the fragment is a Fab' fragment in which each effector molecule attached to the fragment

is attached to a cysteine in the hinge region of the fragment.

19. (withdrawn) A method of producing an antibody Fab or Fab' fragment to which at least one effector molecule is attached comprising: a. treating an antibody Fab or Fab' fragment in which both the interchain cysteine of C_L and the interchain cysteine of C_H1 have been replaced with another amino acid with a reducing agent capable of generating at least one free thiol group in the fragment; and b. reacting the treated fragment with an effector molecule.

20. (withdrawn) The method of claim 19 wherein the reducing agent is a non-thiol based reducing agent.

21. (withdrawn) The method of claim 20 wherein the reducing agent is a trialkylphosphine.

22. (withdrawn) The method of claim 21 wherein the trialkylphosphine reducing agent is tris(2-carboxyethyl)phosphine (TCEP).

23. (withdrawn) The method of claim 21 wherein the trialkylphosphine reducing agent is tris(3-hydroxypropyl)phosphine (THP).

24. (withdrawn) The method of claim 19 wherein either or both of steps (a) and (b) are performed in the presence of a chelating agent.

25. (withdrawn) The method of claim 24 wherein the chelating agent is EDTA.

26. (withdrawn) The method of claim 25 wherein both steps (a) and (b) are performed in the presence of EDTA.

27. (currently amended) A composition comprising a mixture of two or more antibody ~~Fab or~~ Fab' fragments, wherein the mixture is enriched for ~~Fab or~~ Fab' fragments in which the light chains in said fragments are not covalently bonded to the heavy chains, both the interchain cysteines of C_L and C_H1 have been replaced by another amino acid, and at least one effector molecule is attached to the fragments,

wherein said at least one effector molecule is PEG or a PEG derivative, and wherein the hinge region contains one or two cysteines.

28. (currently amended) The composition of claim 27 wherein greater than 50% of the mixture comprises ~~Fab or~~ Fab' fragments in which the light chains in said fragments are not covalently bonded to the heavy chains, both the interchain cysteines of C_L and C_H1 have been replaced by another amino acid, and at least one effector molecule is attached to the fragments.

29. (currently amended) The antibody fragment of claim 1 wherein ~~the~~ each effector molecule is PEG.

30. (previously presented) A pharmaceutical composition comprising an antibody fragment of claim 1, together with one or more pharmaceutically acceptable excipients, diluents, or carriers.